

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 64-024447
 (43)Date of publication of application : 26.01.1989

(51)Int.Cl. H01L 23/36
 H01L 23/46

(21)Application number : 62-180669 (71)Applicant : HITACHI LTD
 (22)Date of filing : 20.07.1987 (72)Inventor : ASHIWAKE NORIYUKI
 NAKAYAMA HISASHI
 YANAGIDA TAKEHIKO
 OGURO TAKAHIRO
 KOBAYASHI AKIMINE

(54) SEMICONDUCTOR COOLER

(57)Abstract:

PURPOSE: To avoid any defective connection of a solder ball for enhancing the reliability thereof by a method wherein the elasticity and the water pressure of a cooling member are felt by a wiring substrate not to be applied on a semiconductor chip or a package.

CONSTITUTION: A spacer 5 is composed of, e.g.) a square flat part 5a bonded onto the lower surface of a diaphragm 3A formed of a heat conductive material and multiple, e.g., three each of holding members 5b erected formed downward around the flat part 5a. The holding members 5b are pressed against a wiring substrate 8 by the elasticity of the diaphragm 3A and the water pressure of cooling water running in a cooling water channel 6. Besides, specified gap C is set up to be formed between the lower surface of the flat part 5a and the upper surface of the flat part 5A by the spacer 5. This specified gap C is filled with grease 16 as, e.g., a soft conductive material. In such a constitution, the spacer 5 is pressed against the wiring substrate 8 by the pressure of cooling water running in the cooling water channel 6 of a water cooling jacket 2 and the elasticity of the diaphragm 3A.

